

REMARKS

I. PRELIMINARY REMARKS

Claims 1-9, 14-17 and 20 have been amended. Claims 10, 18 and 19 have been canceled, as have non-elected claims 21-81. Claims 82-89 have been added. Claims 1-9, 11-17, 20 and 82-89 remain in the application. Reexamination and reconsideration of the application, as amended, are respectfully requested.

II. PRIOR ART REJECTIONS

A. The Rejections

Claims 1-3, 7, 8 and 10-20 have been rejected under 35 U.S.C. § 102 as being anticipated by the Kindler '594 patent. Claims 4-6 have been rejected under 35 U.S.C. § 103 as being unpatentable over the Kindler '594 patent. Claim 9 has been rejected under 35 U.S.C. § 103 as being unpatentable over the combined teachings of the Kindler '594 patent and the Singh '993 patent. As claims 10, 18 and 19 have been canceled, it is respectfully submitted that the rejection thereof under 35 U.S.C. § 102 has been rendered moot. The rejections of the remaining claims under 35 U.S.C. §§ 102 and 103 are respectfully traversed with respect to the claims as amended above. Reconsideration thereof is respectfully requested.

B. Discussion Concerning Claims 1-3 and 7

Independent claim 1 calls for a combination of elements comprising "a fuel cell stack including a **plurality of anodes**" and "a **single fuel supply apparatus** that supplies a plurality of fuel droplets to each of the anodes." Claims 2, 3 and 7 depend from independent claim 1 and include, *inter alia*, the combination of elements defined by claim 1.

The Kindler '594 patent, which discloses various fuel cells systems that supply fuel in aerosol form, fails to teach or suggest the combination defined by independent

claim 1. For example, the Kinder '594 patent describes a number of instances where only one fuel cell (and one anode) is present. More specifically, the Kinder '594 patent indicates that aerosol may be "formed in an aerosol generator situated within the anode chamber of the fuel cell," "formed in an aerosol generator external to the anode chamber of the fuel cell and fed to the anode chamber via a duct," or "formed externally to the anode chamber of the fuel cell, fed to a particle size conditioner situated between the aerosol generator and the anode chamber, and subsequently fed to the anode chamber via a duct." [Column 2, lines 10-42.] Additionally, in the one instance where a stack of many fuel cells is discussed, each anode includes its own aerosol generator(s). [Column 15, lines 57-65.] The Kinder '594 patent does not, however, teach or even remotely suggest "a **single fuel supply apparatus** that supplies a plurality of fuel droplets to each of [a plurality of] anodes."

As the Kinder '594 patent fails to teach or suggest each and every element of the combination recited in independent claim 1, applicant respectfully submits that claims 1-3 and 7 are patentable thereover and that the rejection thereof under 35 U.S.C. § 102 should be withdrawn.

C. Discussion Concerning Claims 4-6

Independent claims 4, 5 and 6 call for respective combination of elements including a "fuel cell" and a device that supplies fuel droplets. Claim 4 specifies that the device is a "thermal drop ejector," claim 5 specifies that the device is a "piezoelectric drop ejector" and claim 6 specifies that the device is a "flexextensional drop ejector." The Kinder '594 patent fails to teach or suggest such combinations.

As noted on page 3 of the Office Action, the Kinder '594 patent does not disclose the use of "thermal," "piezoelectric" and "flexextensional" drop ejectors. Nevertheless, the Office Action states (1) that as compared to the ultrasonic atomizer disclosed in the Kinder '594 patent, such drop ejectors "are considered functionally equivalent fuel supply apparatus" and (2) that it would have been obvious to substitute any one of the "thermal," "piezoelectric" and "flexextensional" drop ejectors for the ultrasonic atomizer disclosed in the Kinder '594 patent. [Office Action at pages 2 and 3.] These conclusory statements are respectfully traversed.

The Office Action does not include any evidence whatsoever (e.g. a prior art reference) which indicates that, in the context of supplying fuel to a fuel cell, “thermal,” “piezoelectric” and “flextensional” drop ejectors are “functionally equivalent” to an ultrasonic atomizer.¹ Note, for example, that the flextensional drop ejector illustrated in Figures 16-18 of the present application may be used to fire drops in two directions. [Page 9, line 29 to page 10, line 11.] Nor has the Office Action provided any evidence which indicates that it would have been obvious to replace an ultrasonic atomizer that is supplying fuel to a fuel cell anode with a “thermal,” “piezoelectric” or “flextensional” drop ejector. The mere fact that Kinder fuel cell system could have been modified in the manner proposed in the Office Action “would not have made the modification obvious unless the prior art suggested the desirability of the modification.” *In re Laskowski*, 10 USPQ2d 1397 (1989) (citations omitted).

Accordingly, applicant respectfully submits that the Office Action failed to make a *prima facie* case of obviousness with respect to claims 4-6 and that the rejection thereof under 35 U.S.C. § 103 is improper and should be withdrawn.

D. Discussion Concerning Claims 8, 9, 11-15 and 17

Independent claim 8 calls for a combination of elements comprising “a fuel cell stack including at least one anode pair arranged such that ***the anodes within the anode pair face one another and define a fuel passage therebetween***” and “fuel supply means for ***supplying a plurality of droplets to the fuel passage*** between the at least one anode pair.” Claim 9 depends from independent claim 8 and includes, *inter alia*, the combination of elements defined by claim 8.

Similarly, independent claim 11 calls for a combination of elements comprising “a plurality of anodes pairs arranged such that the anodes within each anode pair

¹ To the extent that the statement on page 2 of the Office Action was intended to convey that the Examiner has taken “judicial notice” with respect to knowledge generally available in the art, applicant hereby traverses and requests that the Examiner provide an affidavit in accordance with MPEP § 2144.03 and 37 C.F.R. § 1.104(d)(2) to that effect. The affidavit should set forth the facts upon which the Examiner’s conclusions regarding the knowledge available in the art are based. Otherwise, applicant respectfully requests that the Examiner provide a prior art reference which shows that the claimed invention would have been obvious.

face one another and define a fuel passage therebetween” and “a fuel supply apparatus that draws fuel from the fuel reservoir and supplies a plurality of fuel droplets to the fuel passages.” Claims 12 and 13 depend from independent claim 11 and include, *inter alia*, the combination of elements defined by claim 11.

Independent claim 14 is directed to a “method of operating a fuel cell stack having an anode pair arranged such that the anodes within the anode pair face one another and define a fuel passage therebetween.” The method includes, *inter alia*, the step of “directing a spray of fuel droplets into the fuel passage between the anode pair and onto the anodes.” Claims 15 and 17 depend from independent claim 14 and include, *inter alia*, the combination of elements defined by claim 14.

The Kindler ‘594 patent fails to teach or suggest the respective combinations defined by independent claims 8, 11 and 14. For example, the Kindler ‘594 patent fails to teach or suggest a fuel stack with anodes that face one another with a fuel passage therebetween. Nor does the Kindler ‘594 patent teach or suggest apparatus for, or the steps of, supplying fuel droplets to a fuel passage between two anodes.

As the Kindler ‘594 patent fails to teach or suggest each and every element or step in the respective combinations defined by independent claims 8, 11 and 14, applicant respectfully submits that claims 8, 11-15 and 17 are patentable thereover and that the rejection thereof under 35 U.S.C. § 102 should be withdrawn.

Turning to the rejection of claim 9 under 35 U.S.C. § 103, applicant respectfully submits that the Singh ‘993 patent fails to remedy the above-identified deficiencies in the Kindler ‘594 patent. Accordingly, claim 9 is patentable for at least the same reasons as independent claim 8 and the rejection of claim 9 under 35 U.S.C. § 103 should also be withdrawn.

E. Discussion Concerning Claim 16

Independent claim 16 calls for a combination of method steps including, *inter alia*, the step of “directing a spray of fuel droplets onto the anode by generating a spray of fuel droplets and blowing the droplets towards the anode **with a fan**.” The Kindler ‘594 patent fails to teach or suggest such a combination. For example, the Kindler ‘594 patent does not teach or suggest blowing fuel droplets with a fan. The

only time a fan disclosed in the Kinder '594 patent is used to supply air to a cathode. [Column 5, lines 51-54.] The rejection of claim 16 under 35 U.S.C. § 102 is, therefore, improper and should be withdrawn.

F. Discussion Concerning Claim 20

Independent claim 20 calls for a combination of elements including, *inter alia*, "a controller adapted to monitor a rate of fuel consumption at the anode and to control the fuel supply means to supply droplets at a rate that results in a ***fuel layer being maintained*** on the anode." Although the Kinder '594 patent does discuss varying the amount of fuel supplied to the anode (column 7, line 31-46), it does not appear to teach or suggest maintaining a layer of fuel on the anode. The Kinder '594 patent actually appears to teach away from the formation of a fuel layer. [Column 8, lines 18-29.] The rejection of claim 20 under 35 U.S.C. § 102 is, therefore, improper and should be withdrawn.

III. NEWLY PRESENTED CLAIMS 82-89

Newly presented independent claim 82 calls for a combination of elements comprising "a fuel cell including at least one anode defining an anode plane," "a fuel supply path extending in a direction that is non-perpendicular to the anode plane" and "a fuel supply apparatus that directs a plurality of fuel droplets along the fuel supply path to the anode." The cited references fail to teach or suggest such a combination. For example, the Kindler '594 patent teaches firing droplets directly at the anode, i.e. along a path perpendicular to the anode plane (Figure 2), and what appears to be firing droplets across the internal region of an anode biplate (Figure 6). As such, claims 82-89 are patentable thereover.

IV. CLOSING REMARKS

In view of the foregoing, it is respectfully submitted that the claims in the application are in condition for allowance. Reexamination and reconsideration of the application, as amended, are respectfully requested. Allowance of the claims at an early date is courteously solicited.

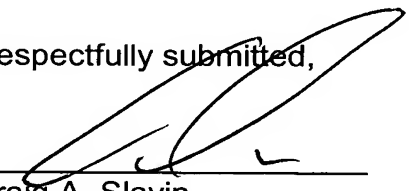
If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is respectfully requested to call applicant's undersigned representative at (310) 563-1458 to discuss the steps necessary for placing the application in condition for allowance.

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 08-2025. Should such fees be associated with an extension of time, applicant respectfully requests that this paper be considered a petition therefor.

2/12/04
Date

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Respectfully submitted,



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